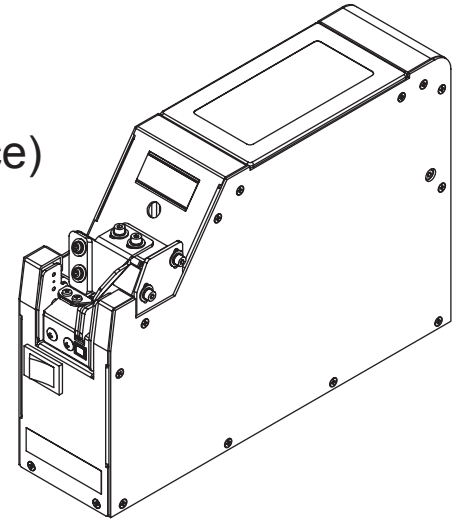
OHTAKE

Japan Quality since1968

Automatic Screw Feeder
自動ネジ供給機

SS Series

Operation Manual (Maintenance)



・Read these instructions for the proper use of this machine.
・After having read these instructions, keep them in a convenient place so you or the operator can refer to them whenever necessary.

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We do not have any branches in China.

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NSN1MA01 M

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1. Before Use

Thank you for purchasing the Automatic Screw Feeder “SS Series.”

Please check if the following parts are included in the package.

- Instruction manual: 1
- Hexagonal wrench: 1
- AC adapter: 1
- Screw-driver: 1

2. Precautions

Installation

⚠Caution Place the machine on a stable flat surface. If the surface is unstable, the unit may fall, overturn, break down, or overheat.
Do not use the machine in a damp place or near flammable or corrosive gas.

AC Adapter

⚠Caution Use the AC adapter included in the package. Failure to do so is dangerous and may lead to malfunction.

Rail

Do not scratch or lubricate the rail. Clean the rail periodically.

Screw

Do not use screws that are dirty, greasy, or that are not specified by this manual.

When Picking up Screws

Do not bump or jar the machiner when picking up screws.
This may result in malfunction or injury.

During Operation

⚠Caution Ensure that there are no foreign objects inside the machine during operation. Also ensure that the operator's fingers etc. are not inside the machine during operation.

Abnormalities during Operation

⚠Caution Stop operation and unplug the AC adapter immediately whenever you sense any abnormalities. Continued operation may result in electric shock, fire or malfunction. Immediately contact the dealer from which you purchased the machine.

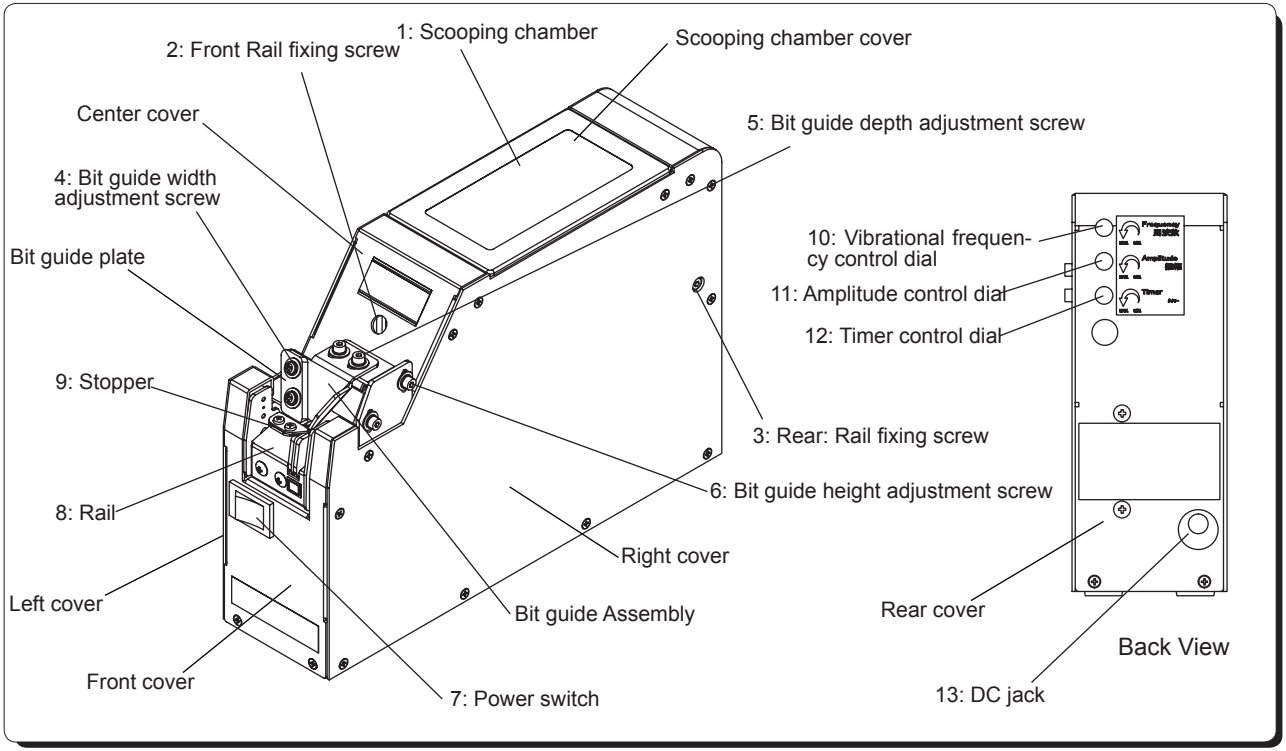
If the Automatic Screw Feeder Remains Unused for a Long Period

⚠Caution If the machine is to remain unused for a long period of time (e.g. when the factory closes), unplug the AC adapter.

Repair

Contact the dealer from which you purchased the machine for repair. Do not disassemble or modify it.

3. Part Names and Descriptions



Part Names	Descriptions
1. Scooping chamber	Place screws in this chamber.
2. Front Rail fixing screw	Loosen this to change the rail.
3. Rear Rail fixing screw	Loosen this to change the rail.
4. Bit guide width adjustment screw	Loosen this to adjust the bit guide width according to the bit diameter.
5. Bit guide depth adjustment screw	Loosen this to adjust the bit guide depth according to the screw diameter.
6. Bit guide height adjustment screw	Loosen this to adjust the bit guide height according to the screw position.
	* Lift the bit guide before removing or attaching the rail.
7. Power switch	Turns the power to the machine on and off.
8. Rail	Set the rail according to the diameter of the screws you are using.
9. Stopper	Stops screws at the tip of the rail.
10. Vibrational frequency control dial	Controls the vibrational frequency using a precision screw driver.
11. Amplitude control dial	Controls the amplitude using a precision screw driver.
12. Timer control dial	Controls the screw feeding (stop) time using a precision screw driver.
	*The machine will stop feeding screws when they fill up the rail.
13. DC jack	Connect the AC adapter included in the package.

4. Set Up and Adjustment

4 - 1. Model Type

- Select the screwdriver bit according to the nominal diameter of screws you are using. Refer to the label number on the rail. (See Picture 1)

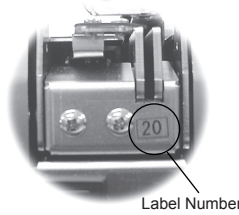
- The machine is adjusted in accordance with model No. (screw size:φ1.0 - 1.7 [cylinder head screw] /φ2.0 - 3.0 [pan head screw]) before shipment.

- Screws can generally be used without further adjustment after the initial adjustment. However, if you are using screws outside the specifications in this manual, the machine may not work properly. **In this case check and readjust the following:**

  - ○ Screw amount
  - ○ Passing plate and slide plate
  - ○ Bit guide
  - ○ Sensor voltage level
  - ○ Brush
  - ○ Vibrational frequency
  - ○ Timer

- The machine can handle several screw diameters simply by changing rails. After changing the rail, fine-tune each part. Adjustment procedures are explained on the following pages. Please read these thoroughly before adjustment.

Model No.	Label No.	Nominal Screw Diameter	Screwdriver Bit Size	
			Bit Tip Diameter	Cross Slot No.
SS−12	10	φ1.0	φ1.5	№ 0
	12	φ1.2		
	14	φ1.4		
	17	φ1.7		
	20	φ2.0	φ2.0	№ 0 or 1
SS−23	23	φ2.3		
	26	φ2.6	φ3.0	№ 1
	30	φ3.0	φ3.2	№ 1 or 2



Picture 1

⚠Caution Be sure to turn off the machine before adjustment.

4 - 2. Basic Operation

The driving motor repeats normal rotation and an inversion for about 2 seconds at a time, and the scooper carries screws to the rail. The vibrator (solenoid) continuously sends screws to the front stopper to be picked up using the screwdriver.
Note:
If no screws are sent for approximately 10 seconds, vibration of a rail becomes stlonger. (The vibration sound, also, increases; however, this is not a problem.)
If no screw is not detected for about 20 more seconds, then the machine stops operating. When you want to start operation again, turn the power switch OFF and ON again or a stopper is operated (extraction sensor perception),

4 - 3. Number of Screws

Adjust the number of screws to ensure the proper alignment and smooth flow of screws. (See Picture 2)
- Adjust the scooping chamber to its lowest position by turning the power to the machine on and off.
- Fill the scooping chamber with screws up to 2mm below the rail groove.
- Be sure not to cover the front of the sliding plate with screws.
- Always ensure there are adequate screws for the operation.

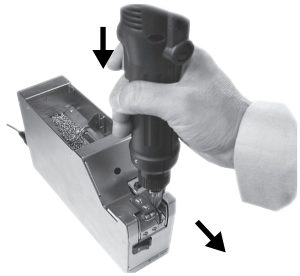
View from the Above

Do not cover the front of the sliding plate with screws.

Picture 2

4 - 4. Operation Check

- If each part is adjusted appropriately, screws are sent to the stopper.
- Pick up screws from the stopper using the electric screwdriver. Using the bit guide as a guide, pull the screwdriver downward. Fit the screwdriver bit into the cross slot of the screw and then pull the screwdriver toward you in a horizontal direction to pick up the screw. (See Picture 3)
- Do not use force when fitting the screwdriver bit to the screw head. This may bend the rail or lead to malfunction of the machine.
- To fit the bit securely into the cross slot of the screw, slightly rotate the screwdriver bit.
- Select the screwdriver bit according to the nominal diameter of the screws you are using. (Refer to “4-1. Model Type.”)
- If screw alignment or flow is abnormal, check and adjust each part. (Refer to “4-1. Model Type”)



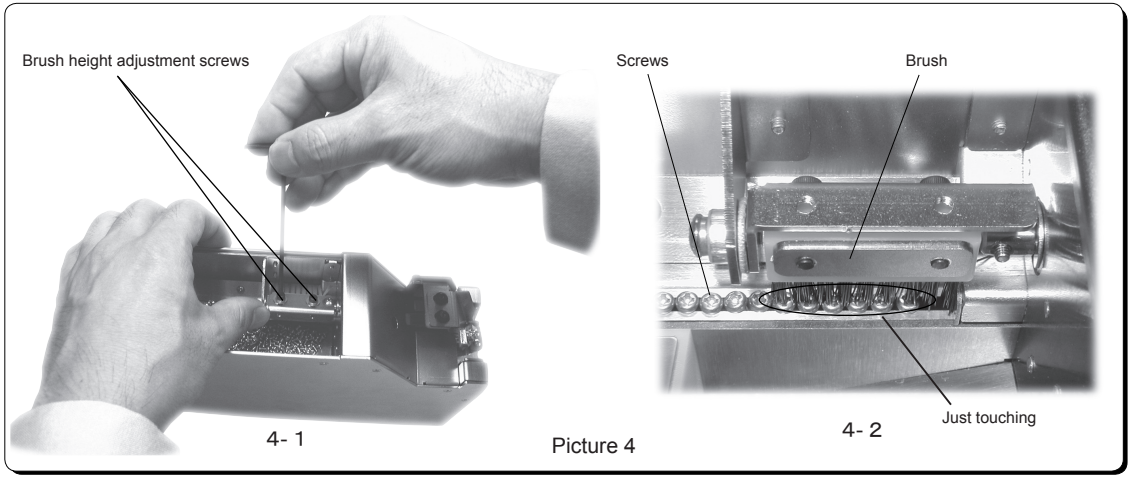
- Pull the screwdriver downward and fit the screwdriver bit into the cross slot of the screw.
- Pull the screwdriver toward you in a horizontal direction to pick up the screw.

Picture 3

4 - 5. Brush Height Adjustment

No adjustment is necessary if the tip of the brush touches the screw head in the rail groove and rotates when the machine is turned on.

- Turn the machine off before adjusting the brush height.
- Loosen the brush height adjustment screws to adjust the brush height. (See Picture 4-1)
- Move the brush manually to check that the brush touches heads of the screws in the rail groove. (See Picture 4-2) If the brush position is too high, screws in incorrect positions cannot be caught. If the brush position is too low, it may sweep even correctly positioned screws from the rail or it may stop rotating.



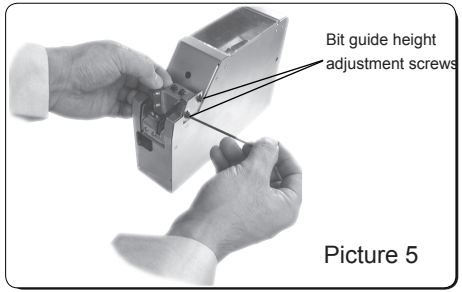
Picture 4

4-5-1. Height Adjustment of Passing and Holding Plates (How to Remove the Rail)

● If screws stop before reaching the stopper, adjust both the passing and holding plates.

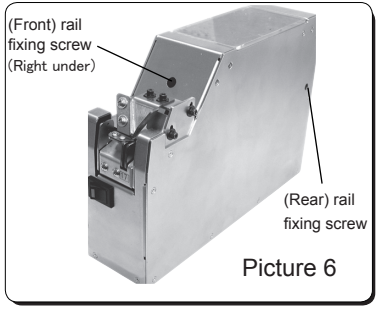
Note:
Be sure to eject all screws from the before replacing the rail.

● Loosen the bit guide height adjustment screws. (See Picture 5)

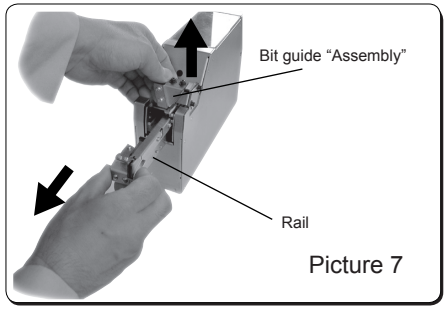


Picture 5

● Slightly loosen the front and rear rail fixing screws. (See Picture 6)
● Lift the bit guide “Assembly” and pull the rail out in a horizontal direction. (See Picture 7)



Picture 6



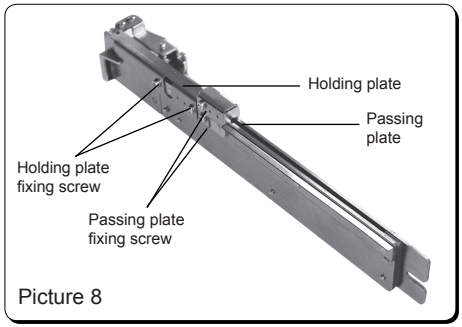
Picture 7

4-5-2. Height Adjustment of Passing and Holding Plates

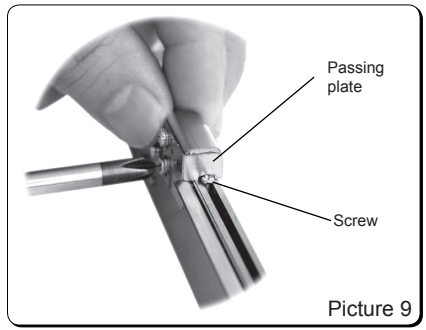
- Both the passing and holding plates are fixed to the rail. (See Picture 8)

- Place a screw between the passing plate and the rail grove and adjust the height of the passing plate by loosening the passing plate fixing screw. (See Picture 9) If the gap between the passing plate and the rail groove is too wide, the screw flow may stop. If the gap is too small, the screw flow may also stop. (Screws cannot pass through the gap.) Adjust the height to the exact height of the screw head.

- Optional passing plates for various screw types, including thin head screws, are available. Contact the dealer from which you purchased the machine with details of the screw size you are planning to use.



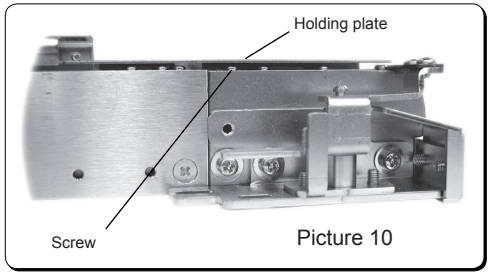
Picture 8



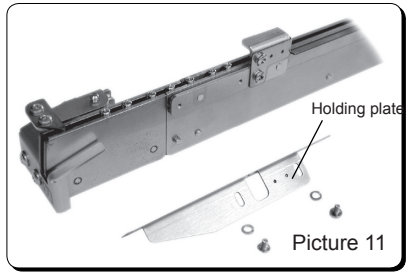
Picture 9

● Put a screw into the rail groove, just beneath the holding plate, and adjust the holding plate height so that there is an adequate gap between the holding plate and the rail groove for the screw head. Loosen the holding plate fixing screw and adjust the gap between the holding plate and rail groove. (See Picture 10) Removing the holding plate before adjustment will allow you to easily place screws into the rail groove easily. (See Picture 11) If the gap between the holding plate and the rail grove is too wide, screws may fall out. If the gap is too small, the screws may not be able to pass through. Set the gap to between 0.2 to 0.5mm above screw heads. If you are using long screws, adjust the gap so that it is a little higher.

Note: When using washer head screws, make the gap wider. If the gap between the holding plate and the rail groove is not wide enough, washers may become stuck between the holding plate and the rail causing the screw flow to stop.



Picture 10

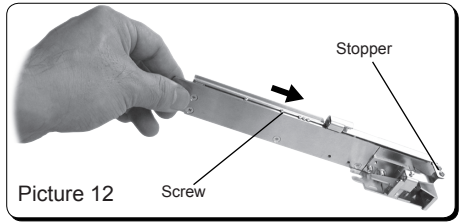


Picture 11

● After adjustment, place a screw into the end of the rail groove. Tilt the rail and check that the screw moves smoothly to the stopper position. (See Picture 12)

● After checking, reverse the procedure for removing the rail to reattach it. (Fix the screws when the rail makes contact with the machine.)

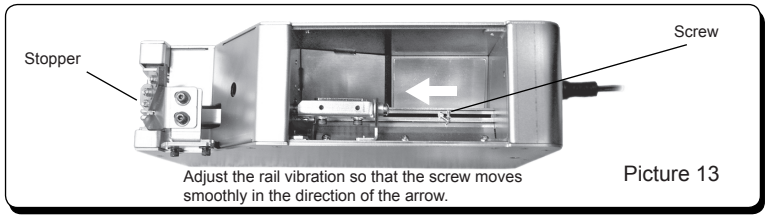
Note: If the front and rear rail fixing screws are not loosened, the rail cannot be attached to the correct position.



Picture 12

4-6. Rail Vibration Adjustment

- The rail vibration has been adjusted before shipment using screws that correspond to the rail size. (Refer to the label number on the rail for the nominal screw diameter: e.g. 17 is φ1.7)
- Put 2 or 3 screws into the rail groove and turn the machine on.
- No adjustment is necessary if the screws move to the stopper position smoothly. (See Picture 13)
- When the number of screws is low and no screw is picked up in a given period of time, vibration will become the maximum and it will stop operation after that. (Refer to 4-2 “Basic Operation.”)Adjustment of volume is not effective at the time of a forced oscillation.
- After it stops, turn on the machine again and repeat the above procedure.



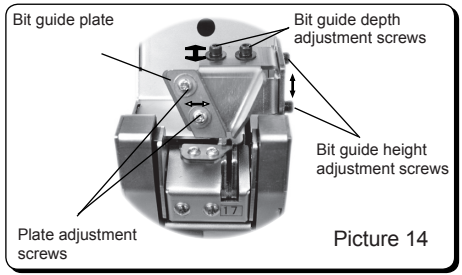
Picture 13

- Adjustment is necessary if the screw flow is not smooth or if there is too much rail vibration.
  - ○ Adjust the Amplitude control dial on the back of the machine using the precision screwdriver.
  - ○ Adjust the Vibration frequency control dial on the back of the machine using the precision screwdriver and find the resonance point.

  Adjust these dials to locate the optimum conditions for smooth movement of screws.
- Maximize the amplitude and adjust the vibration frequency to locate the resonance point (frequency when the rail vibration is at a maximum.) Then turn down the amplitude to locate the optimum conditions for smooth movement of screws.
- Although it is not recommended, the rail vibration can be adjusted while the machine is operating.
- During control dial adjustment, do not force the screwdriver beyond its rotation limits.

4-7. Bit Guide Adjustment

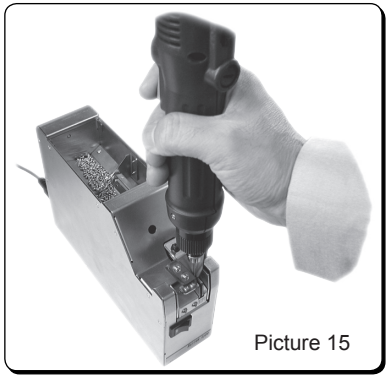
- Bit guide position adjustment is explained below.
- Pick up several screws to adjust the bit guide.
- Adjust the bit guide position after loosening the adjustment screws. (See Picture 14)



Picture 14

How to Adjust the Bit Guide Position

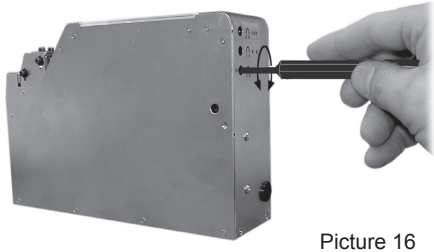
- Use the bit guide height adjustment screws to adjust the bit guide height so that it doesn't touch the holding plate.
- Use the plate adjustment screws and bit guide width adjustment screws to adjust the bit guide groove width and position so that the bit guide width matches the holding plate groove width.
- Fit the screwdriver bit into the bit guide and adjust the bit guide groove width so that the screwdriver bit moves smoothly. (See Picture 15)


Picture 15

4-8. Timer Adjustment

The machine is equipped with a screw sensor that detects the number of screws on the rail.
If a screw accumulates to some extent on a rail, operation of a scooping block will stop and vibration will stop after timer set time.
The timer should normally be set to “Min.”
However if screws are moving slowly, it may be necessary to set the timer to “Max.”

- Adjust the Timer control dial on the back of the machine using a precision screwdriver. (See Picture 16)
- Turn the dial clockwise to reduce the vibration time. Turn it counterclockwise to increase the vibration time.
- During control dial adjustment, do not force the screwdriver beyond its rotation limits.
- Set the timer after checking that the rail is filled and that the screws are properly aligned.
- Use the provided screwdriver for adjusting the timer.



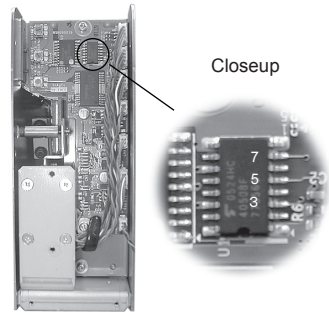
Picture 16

4-9. Sensor Voltage Level Adjustment

Screws can generally be used without further adjustment after the initial adjustment. However, if you are using screws outside the specifications in this manual, the machine may not work properly. In this case check and readjust the following:

Adjust the sensor levels for when screws are on the rail and for when no screws are on the rail.

Remove the rear cover of the machine to check the IC on the printed circuit board. (See Picture 17)
Measure the voltage level using Pins 3, 5, and 7 on the IC4050. Ground the metal part of the body. (Use testing clips for the voltage measurement. Recommended item: Testing clip <FP-7> manufactured by Sunhayato Corp.)



The rear cover is removed. Picture 17

*** Screw Sensor Adjustment (Pin 3) ***

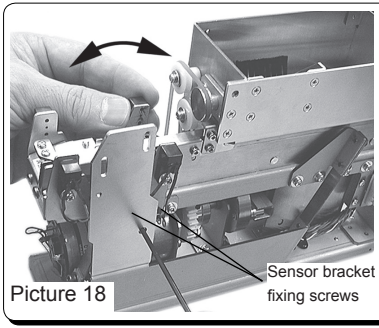
The screw sensor detects whether or not there are any screws remaining on the rail.

Loosen the light receiving sensor bracket fixing screws (2 pcs.) and adjust the sensor level by rotating the bracket. (See Picture 18)

0.25 – 1.5V: There are no screws remaining on the rail.

3.5V or more: There are screws on the rail.

If the voltage is 2.5V or over, the sensor judges that there are screws on the rail.

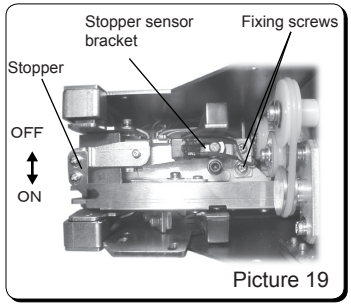


Picture 18

*** Stopper Sensor Adjustment (Pin 5) ***
The stopper sensor detects stopper movement.
Loosen the stopper sensor bracket fixing screws (2 pcs) and adjust the light receiving sensor position horizontally. (See Picture 19)

4.0V or more: Stopper ON
0.2V or less: Stopper OFF

If the voltage is 2.5V or over, the sensor judges that there are screws on the rail.

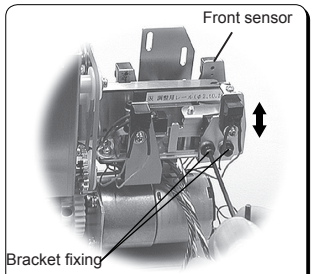


Picture 19

*** Front Sensor Adjustment (Pin 7) ***
The front sensor detects whether or not there are any screws remaining on the stopper.
Loosen the front sensor bracket fixing screws (2 pcs) and adjust the light receiving sensor position vertically. (See Picture 20)

0.25 – 1.5V: There are no screws on the stopper.
3.5V or more: There are screws on the stopper.

If the voltage is 2.5V or over, the sensor judges that there are screws remaining on the stopper.



Picture 20

After checking and adjusting each part, test run the machine using the screws you actually intend to use.
If the machine does not run properly, repeat the above adjustment as well as rail position and
vibration adjustments. After the test run, return the sensor wiring to its original condition.

⚠Caution Do not pinch the wiring and ensure it is clear of the machine's moving parts.

5. Maintenance

Dust, dirt, or grease in the rail groove may reduce the screw feeding speed.

If dust, dirt, or grease is evident in the rail groove, wipe it with a soft, clean alcohol-soaked cloth. Remove the rail if it is hard to wipe.
Be sure to turn off the machine and remove all screws from the scooping chamber before removing the rail. (Refer to Page 9 “4-5-1. Height Adjustment of Passing and Holding Plates (How to Remove the Rail)”)

Please replace the rail if there is noticeable grease, dirt or scratch on it.

6. Parts Replacement and Adjustment

The brush, driving belt, and driving motor are all consumable parts.
You will need to order another rail if the size of the screw you are using is to be changed.

Read the instructions below thoroughly before adjustment. Be sure to remove all screws from inside the machine before replacement.

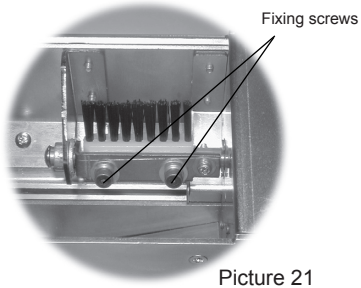
⚠Caution Turn off the machine before replacing or adjusting parts.

6-1. How to Replace and Adjust the Brush

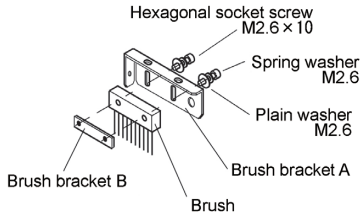
If the ends of the brush are worn and do not wipe-off the screws that are out of alignment, replace the brush.
Optional hard brushes are also available. Contact the dealer from which you purchased the machine for further information.

- Turn the machine on and off until the brush comes out to a position where you can remove the brush fixing screws. (See Picture 21)
- Refer to the diagram under Picture 21 to replace the brush.
- Reverse the procedure for removing the brush to attach a new one.
- Refer to Page 8 “Brush Height Adjustment” for adjustment.

Brush Item Nos.: NSN02107 (for Model SS-12)
NSN22001 (for Model SS-23; option for Model SS-12)



Picture 21

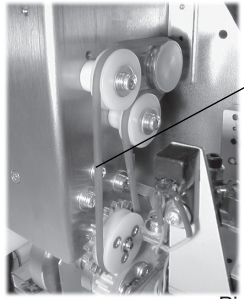


6-2. How to Replace and Adjust the Driving Belt

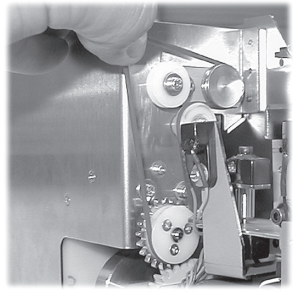
If the driving belt is worn causing the brush to slip or not rotate properly and screws that are out of alignment are not being picked up properly, replace the driving belt.

- Turn the machine off and remove the left and center covers.
- When you remove the covers, you will be able to see the four rollers that the driving belt is fitted around. (See Picture 22)
- Remove the belt with your fingers as shown in Picture 23.
- Reverse this procedure to attach the new belt.
- After attaching the belt, check that each part moves normally. (See Chapter 4 “Set Up and Adjustment”)

Driving Belt Item No.: NSN03114



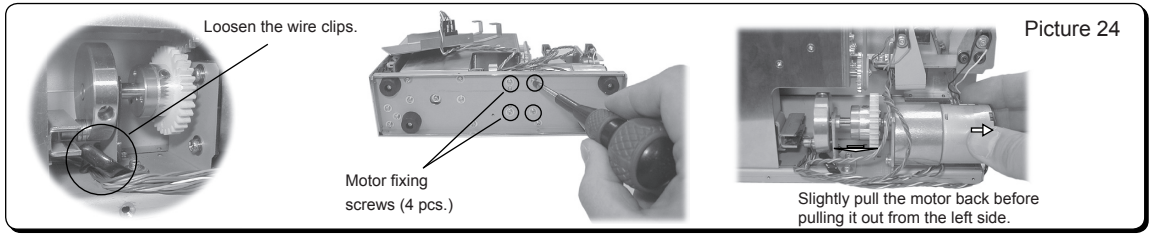
Picture 22


Picture 23

6-3. How to Replace the Main Motor Unit

If the motor is damaged, replace it with a new motor.

- Remove the rail and the front, center, left, and right covers. Loosen the clips (2pcs.) holding the cable.
- Remove the harness (blue and orange) of a motor from a circuit board.
- Remove the motor fixing screws (4 pcs.) from the bottom of the body and then pull the motor out in a horizontal direction from the body. (See Picture 24)

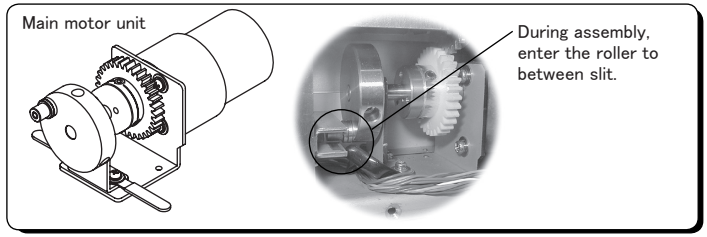


Picture 24

- Reverse the procedure for removing the motor to attach the new one.

Note: Do not pinch the motor wiring in order to ensure it is not damaged.

Main motor unit Item No.: NSN 03001



7. Miscellaneous

Overload Protection Circuit

The machine is equipped with an overload protection circuit.
Normally, the driving motor rotates and sends screws to the rail.
However, if an overload is applied to the machine's moving parts, the driving motor rotates in the counter direction for a given length of time and then rotates normally again.
If this action rectifies the overload, the machine resumes screw feeding; however, if there is still an overload, the motor continues to rotate in normal and opposite directions and then the power to the motor is cut off.

If the power to the motor is cut off, turn off the machine and remove the cause of overload.

For example, if there are too many screws in the scooping chamber, remove some of them. Remove any screws stuck in the machine's moving parts.

After eliminating the cause of overload, turn the machine on and restart operation. (Power reset)

8. Troubleshooting Checklist

⚠Caution Be sure to turn off the machine before checking the problems listed below.

Problem	Cause of Problem	Troubleshooting
8-1. The machine does not run after being turned on.	○ The power is cut off. ○ No screw was picked up from the screw holding groove for a given period of time. ○ There are too many screws in the scooping chamber. ○ An object is stuck inside the machine. ○ AC adapter failure	○ Check that the AC adapter is properly connected to the power source. ○ Pick up the screw in the screw holding groove. ○ Adjust the Timer control dial. ○ Reduce the number of screws in the scooping chamber. ○ Remove the object.
8-2. The rail does not move back and forth.	○ An object (e.g. screw) is stuck between the rail and the body. ○ Even though there is no object stuck between the rail and the body, it does not vibrate.	○ Remove the object. ○ Check and adjust the amplitude. If the rail does not vibrate after the adjustment, contact the dealer from which you purchased the machine for repair.

Problem	Cause of Problem	Troubleshooting
8-3. The flow of screws has stopped.	○ The screws are the wrong size for the rail.	○ Use screws appropriate to the rail size.
	○ There are not enough screws in the scooping chamber.	○ Place screws into the scooping chamber.
	○ A screw is stuck between the passing plate and the rail groove and the brush cannot remove it.	○ Adjust the brush. ○ Adjust the passing plate. ○ Place screws into the scooping chamber. ○ Replace the driving belt. ○ Use a hard brush. (optional)
	○ A screw is stuck on the rail.	○ Remove the screw. Follow the procedure below. Pull up the holding plate and remove the screw. Then adjust the holding plate position. Be careful not to scratch the rail.

Problem	Cause of Problem	Troubleshooting
8-4. Screws have fallen into the rail groove.	○ The screws are the wrong size for the rail. ○ The screw is shorter than the rail groove depth.	○ Use screws appropriate to the rail size ○ Contact the dealer from which you purchased the machine with details of your screw size.
8-5.The screws do not flow smoothly.	○ The gap between the holding plate and the screw head is too small. ○ Spring washer screws are smaller than the type specified for the rail being used. ○ There is dust, dirt, or grease on the rail. ○ The rail vibration is insufficient. (The rail touches the body.)	○ Adjust the holding plate. ○ Adjust the vibration frequency. ○ Tilt the machine slightly. ○ If the speed of the screw flow does not increase after the above adjustments, contact the dealer from which you purchased the machine. ○ Wipe the rail with a soft, clean alcohol-soaked cloth. ○ Check and adjust the vibration frequency. ○ If the rail touches the body, contact the dealer from which you purchased the machine for repair. ○ Replace the driving motor.

Problem	Cause of Problem	Troubleshooting
8-6. Screws are inclined and pass through the passing plate too quickly.	○ The passing plate has not been adjusted correctly. ○ There are too many screws in the scooping chamber.	○ Adjust the passing plate. ○ Reduce the number of screws in the scooping chamber.
8-7. No screw comes out to the screw holding groove.	○ Screws are stuck on the rail.	○ Adjust the holding plate position.
8-8. The machine stops suddenly.	○ The overload protection circuit was activated. ○ There are too many screws in the scooping chamber. ○ An object (e.g. screw) is stuck between the rail and the body. ○ A screw remains in the stopper for a given period of time.	○ Reset the main power. ○ Eliminate the cause of overload. ○ Reduce the number of screws in the scooping chamber. ○ If the machine stops even after the number of screws has been reduced, contact the dealer from which you purchased the machine for repair. ○ Remove the object.

ProblemProblem	Cause of Problem	Troubleshooting
8-9. The machine keeps scooping screws even though there is a screw in the screw holding groove.	○ The rail is not filled with screws, or a screw has been trapped somewhere on the rail. ○ The sensor is not detecting whether or not there are screws on the rail.	○ Adjust the passing plate. ○ Adjust the sensor voltage level.
8-10. The rail vibration does not stop even though there is a screw at the stopper.	○ The sensor is not detecting whether or not there are screws on the rail.	○ Adjust the sensor voltage level.
8-11. Screws have fallen inside the machine.		○ Remove the cover and pick up the screws.
8-12. The machine makes a high-pitched noise.	○ Incorrect amplitude or vibration frequency ○ Out of grease	○ Adjust the amplitude or vibration frequency. ○ Grease the moving parts. Recommended item: BR2Plus manufactured by Dow Corning Asia Co., Ltd

9. Specifications

Power AC adapter (switching type)	Input:AC100～240V 50/60Hz Output:DC15V 1A
Dimensions	55(W) × 205(D) × 143(H) (mm)
Weight	Approx. 2. 4Kg (including rail)
Screw capacity	Approx. 40cc
Following accessories	Operation Manual 1 copy AC Adapter 1 unit Hexagonal Wrench 1 piece Screwdriver 1 piece

Screw feeder series	Screw feeder model	Screw size	Rail model No.
SS-12	SS-1210	φ 1.0	WR10
	SS-1212	φ 1.2	WR12
	SS-1214	φ 1.4	WR14
	SS-1217	φ 1.7	WR17
	SS-1220	φ 2.0	WR20
SS-23	SS-2323	φ 2.3	WR23
	SS-2326	φ 2.6	WR26
	SS-2330	φ 3.0	WR30

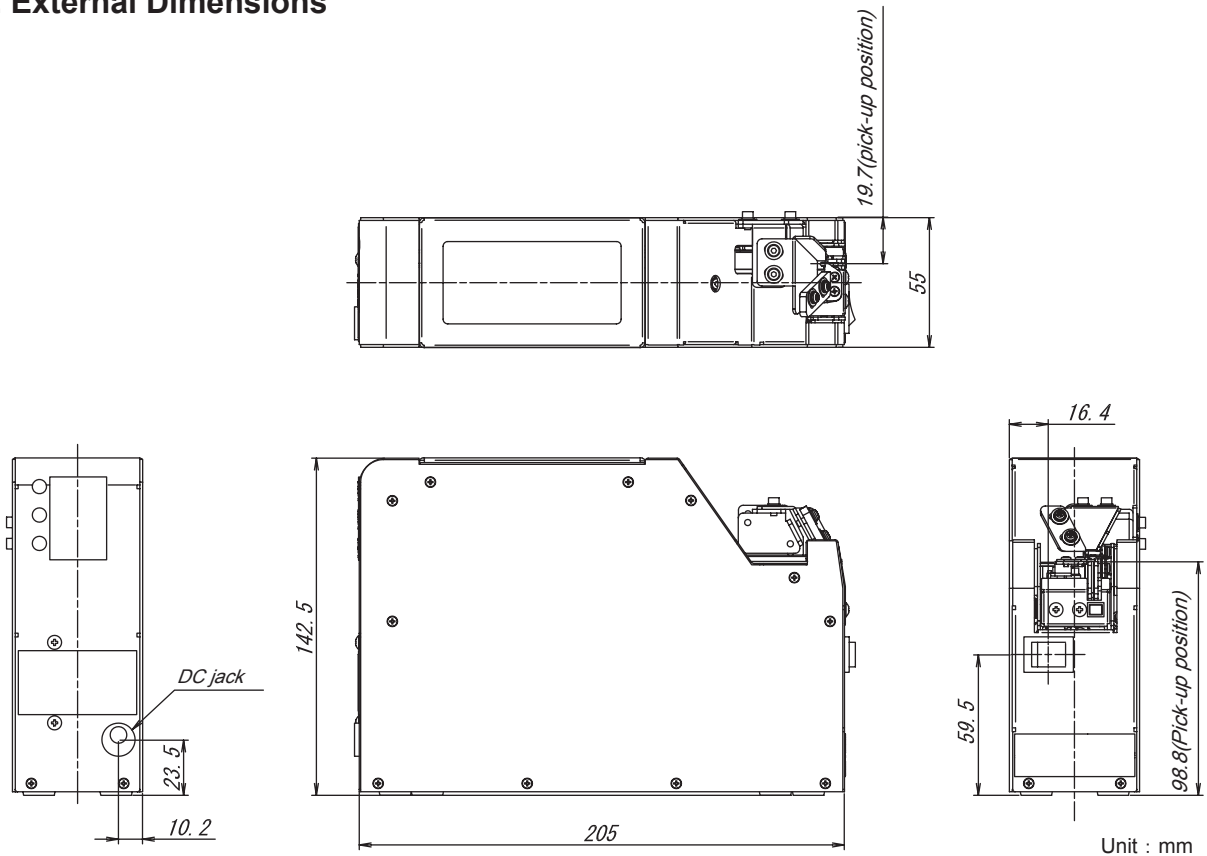
Reference table of the specified screws						Shape of screw head						
						Pan head						
Screw size	Screw shaft diameter(φ)	Screw head diameter (φ)	Washer diameter (φ)	Screw head thickness (mm)	Screw shaft length (mm)	Sems	Double sems	Washer head	Bind	Truss	Precision screw	hexagon flange bolt
φ 1.0	0.9～0.95	1.2～2.0	–	0.35～1.0	1.6～10						○	
φ 1.2	1.1～1.15	1.4～2.3	–	0.35～1.0	1.8～10						○	
φ 1.4	1.3～1.4	1.7～2.5	–	0.35～1.0	2.0～10						○	
φ 1.7	1.6～1.7	2.0～3.0	–	0.35～1.0	2.3～10						○	
φ 2.0	1.9～2.1	2.4～4.0	2.4～6.0	0.35～1.3	2.6～16	○	○	○	○	○	○	○
φ 2.3	2.2～2.4	2.7～4.0	2.7～7.0	0.35～1.5	2.9～16	○	○	○	○	○	○	○
φ 2.6	2.5～2.7	3.0～4.5	3.0～7.5	0.35～1.7	3.2～16	○	○	○	○	○	○	○
φ 3.0	2.9～3.2	3.5～5.5	3.5～8.0	0.35～2.0	3.6～16	○	○	○	○	○	○	○

Note) Compatible with washer thickness 0.35 to 1.0 mm.

Note:

- Check that the screw diameter matches the rail groove width.
- Within The range of screw size and length below,there may be instances of unique screw shape or structure not compatible with the feeder unit.
- When changing the rail, check that the rail number matches the model number of the model you are using.
- Interchangeable rails are optional.
- The design, features and specifications of the machine may be modified without prior notice to improve quality.

10. External Dimensions



Unit : mm

11. Warranty

For users within Japan, the effective term of warranty is 6 months after delivery.
Such warranty will not be applicable to purchases or users outside of Japan.
If any troubles should occur, please contact your dealer.
After the warranty period, repair services will be completed.
In the following cases, the purchaser shall pay for parts and labor regardless of the terms of warranty:

① Failure due to improper handling.
② Failure due to product modification or improper processing.
③ Failure due to causes beyond control (for example earthquake or fire).
④ Failure attributable to any cause other than this product.
⑤ Consumables (brushes, driving belt, main motor)
and replaceable parts and replacement work expenses.

As a rule, we keep performance parts for repair (parts required to maintain the product function) of this machine for 5 years after discontinuation of production.
After the lapse of the parts possession period, some failures may be reparable.
Consult your dealer or our service section.

http://www.ohtake-root.co.jp

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(as of November, 2014
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